CASA GRANDE MUNICIPAL AIRPORT MASTER PLAN

CHAPTER 1 - INVENTORY

1.1 INVENTORY

An inventory of existing facilities, including present airport land uses and ground side developments, presents the pertinent backup information and data necessary for determining future aviation requirements at the Casa Grande Municipal Airport. Aviation forecasts will compare the expected demand to the existing capacity of the airport. Facilities required to safely handle the forecast demand and a schedule of priorities and phasing for various proposed improvements will be developed.

1.2 AREA OF STUDY

The Casa Grande Municipal Airport is located north of the City of Casa Grande, Arizona in Township 5 S, Range 6 E, Sections 29, 31, 32. It is located south and west of Interstate 10 and west of Arizona Highway 387. The Gila River Indian Reservation boundary is located approximately five miles north of the Airport. The airport is owned and operated by the City of Casa Grande and occupies approximately 665 acres. All the property is owned in fee title with approximately 30 acres in aviagation easements.

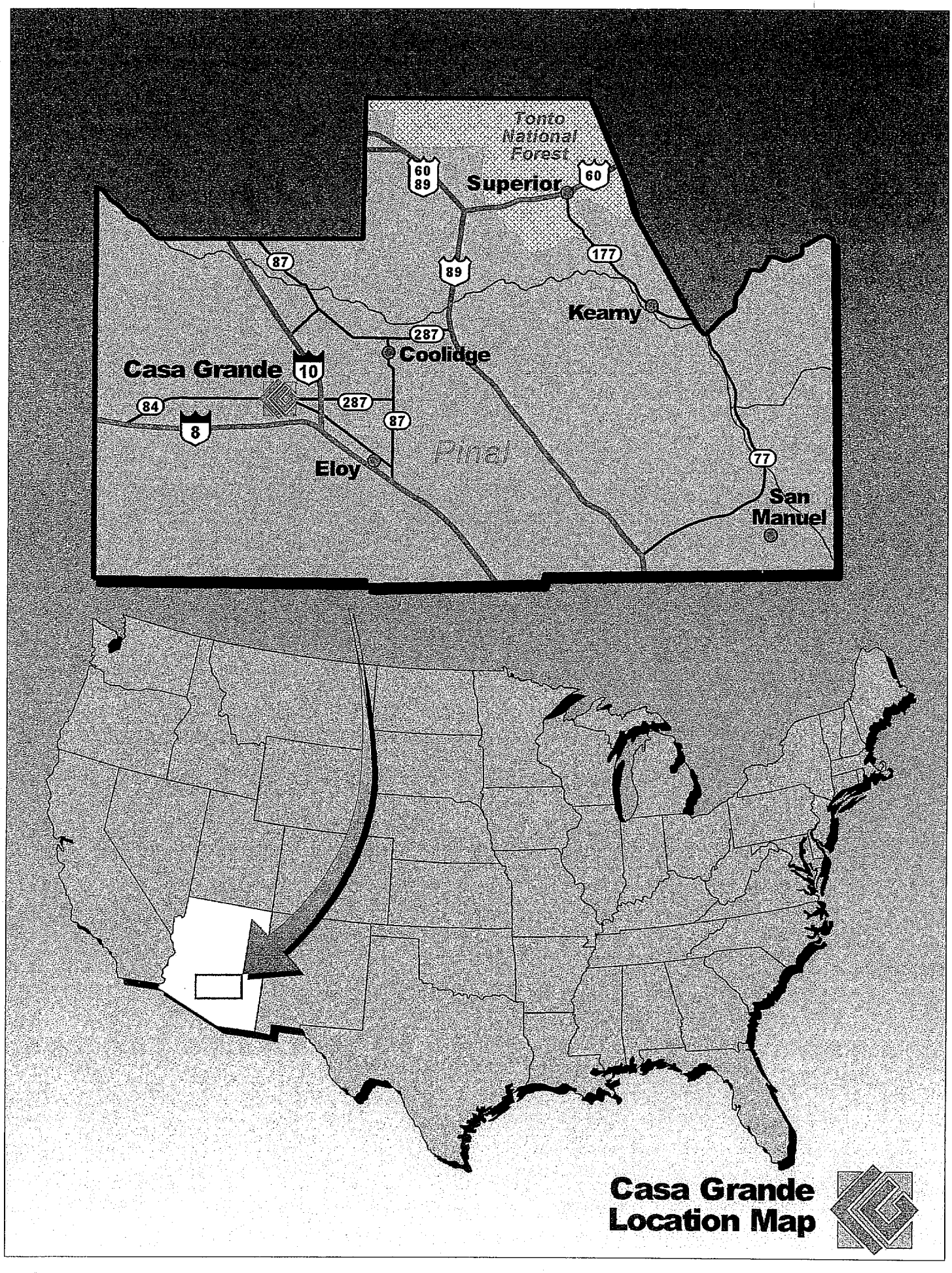
1.3 AIRPORT FACILITIES

General

The existing facilities include a paved primary runway (05-23), three major taxiways, apron and tiedown areas, hangars, a lighted wind sock, segmented circle, and rotating beacon. Runway 05-23 has a Medium Intensity Runway Lighting System (MIRL) with precision instrument markings for Runway 05 and basic markings on Runway 23. Approach aids include a Visual Approach Slope Indicator (VASI), Runway End Identifier Lights (REILS), threshold lights, and a Category I Instrument Landing System (ILS). Two published instrument approaches into the Airport can be executed. The approaches to Runway 5 consist of a VOR/GPS approach or an ILS/DME approach.

Runway

The existing Runway 05-23 is 5,200 feet in length and 100 feet wide. Beginning at the Runway 5 threshold, the runway slopes uphill from an elevation of 1445 to an elevation of 1462 at the Runway 23 threshold. This location is the high point on the runway. Given these elevations, any two points 5.0 feet above the runway centerline are mutually visible for the entire runway length, this complies with FAA runway visibility criteria. The ratio of elevation differential to the total runway length is 0.33%.



Casa Grande Location Map

Pavement

The Runway has an asphaltic concrete surface. A Pavement Condition Index Survey (PCI) was conducted by City forces on the Airport in 1996 as part of the this Master Plan Study and is included in Appendix A. Pavement design records indicate a pavement section comprised of a 5 inch thick asphalt surface course over 8 inches of crushed base course. The existing pavement is rated at 18,500 lb. single wheel loading and 65,000 lb. dual wheel loading.

RPZ

Other important items relating to the runways at the Airport include the Runway Protection Zones (RPZ), and the approach surfaces. The RPZ is defined as an area off the runway end used to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape and centered about the extended runway centerline. The existing Runway 5 RPZ lies within airport property boundaries and the Runway 23 RPZ extends beyond airport property. However, avigation easements protect the areas beyond the property limits. Arizona Highway 387 lies within the Runway 23 RPZ.

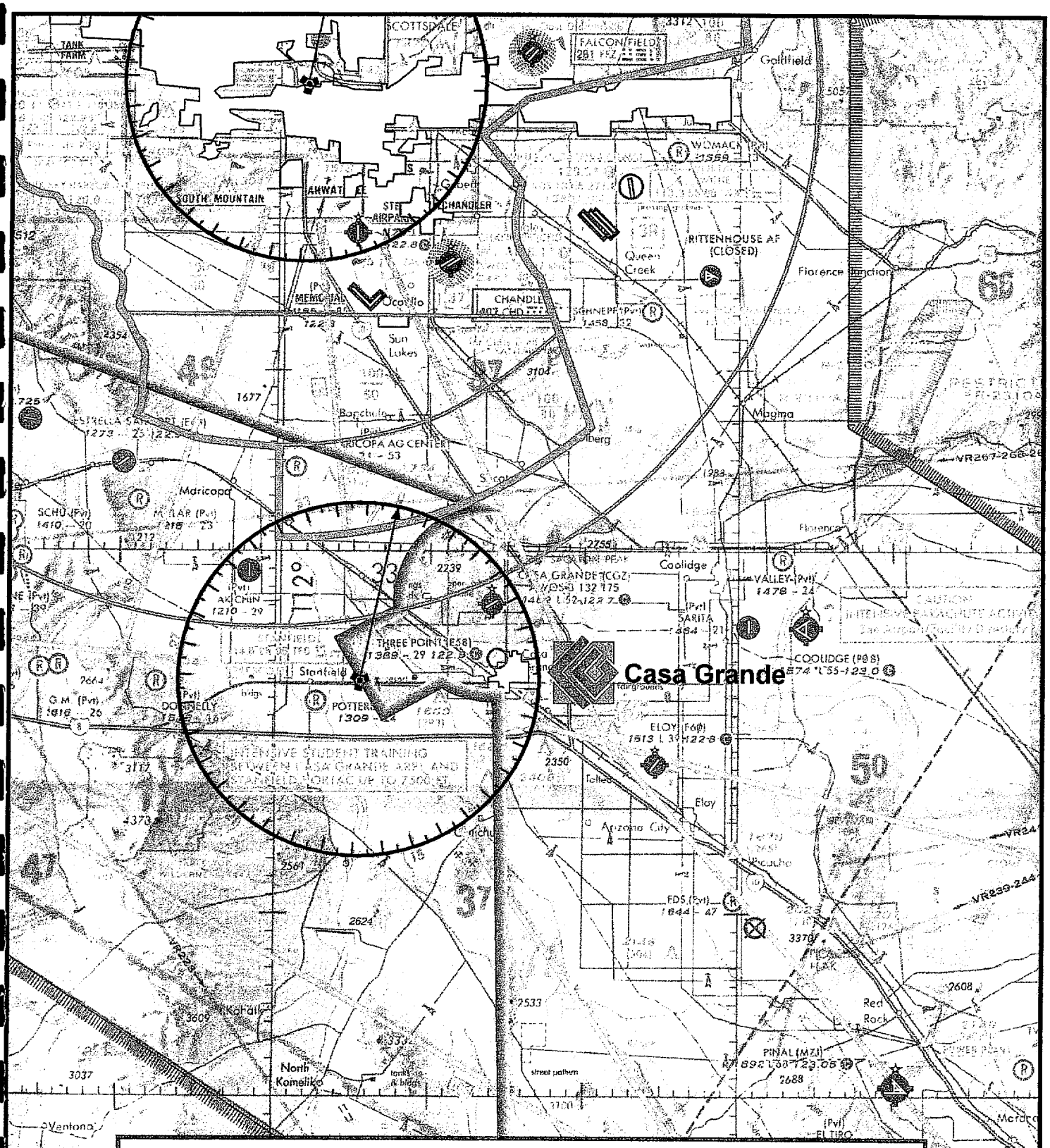
Approaches

At the Casa Grande Airport, a 50:1 precision instrument approach surface is the primary approach to Runway 5. The approach minimums are published at 285' height above touchdown (HAT) with a ½ mile visibility. The best approach minimums available for a Category I (CAT I) Instrument Landing System (ILS) are 200' HAT and ½ mile visibility.

A 50:1 approach means that for every 50 feet measured outward (horizontally), the approach surface rises vertically one foot. For paved runways, the approach surface extends outward and upward at a 50:1 slope from a point which is located 200 feet beyond the threshold and at the same elevation as the threshold. The width at the inner edge of the approach surface is the same width as the "primary surface", 1,000 feet for precision instrument runways, and then expands uniformly outward for a distance of 10,000 feet and to a width of 5,000 feet. Beyond this point the approach surface continues an additional distance of 40,000 feet to a width of 16,000 feet. Any object which penetrates the approach surface such as trees, towers or buildings is considered to be an obstruction. Highways and railroads are also evaluated to include consideration of additional heights 15 feet and 23 feet respectively to simulate vehicle passage.

The current approach for Runway 5 has several obstructions such as trees, shrubs and fences. More detailed information is available on the Approach Surface Drawings found on sheet number 4 of the Airport Layout Plan.

The following exhibit illustrates the current airspace designations in the Casa Grande Area.



Area Airspace and Airports

Airports having Control Towers shown in Blue all others shown in Magenta

- Other than hard-surfaced runway
- Hard-surfaced runway 1500 ft. to 8069 ft. in length
- Hard-surfaced runway greater than 8060 ft. or some multiple runways less than 8069 ft.
- Abandoned-paved, having landmark value, 3000 ft. or greater
- Airport with services during normal working hours depicted by ticks around basic airport symbol
- ☆ Rotating airport beacon in operation sunset to sunrise
- VORTAC
- Non-Directional Radiobeacon
- Class B Airspace
- Class E Airspace with floor 700ft. above surface
- MOA - MIlitary Operations Area
- Class E Airspace low altitude Federal Airways
- Compass
- Mode C

Hangars

Hangars consist of a 10 unit shade hangar, an 8 unit shade hangar, two 6 unit nested T-Hangars and a 12 unit T-hangar for a total of 42 hangar spaces. There is also a new 4,800 square foot hangar owned privately. Hangar occupancy is 100 % at the time of this writing. The response to the User's Survey indicate that there continues to be a need for hangar space. Validation of Casa Grande hangar waiting list indicated 12 airport users desired hangar space when it became available. These 12 users do not currently hangar at CGMA.

Terminal

The terminal building was built in 1981 with 1,400 square feet. It contains offices, restrooms, a pilot briefing and flight planning area, conference room and a fuel service desk. The building is in fair condition. The foundation is deteriorating and sewer service is provided by a septic tank and drainfield system.

Access

Pinal Avenue/State Highway 387 provides access to the airport. An access road leads directly to the terminal building and the FBO facility. The access road crosses the taxiway "C" and auto traffic must stop at the taxiway before crossing from either direction.

There are 22 auto parking spots a available to terminal users, FBO patrons, and occupants of the shade hangars.

Other Buildings

Thirteen buildings are located on the airport, including an administration terminal building, a FBO office/hangar and two corporate hangars and three T-hangars, and two shade hangars. The tallest structure, an antenna located atop the airport beacon, has a top elevation of 1,509' MSL, and is located approximately 850' from the runway centerline. The buildings are generally in good condition structurally and visually considering age of the airport. Several of the buildings could use a face lift such as painting and some minor repairs. However, there does not appear to be an immediate need to remove any of the buildings due to a lack of structural integrity.

Fuel

There is currently one dedicated location at the airport where fuel is stored. Two entities are currently providing fuel services using trucks for fuel storage and dispensed via fuel trucks. The City owned facilities are located at the fueling island and the storage tanks are underground adjacent to the island. The 100 Low Lead fuel is stored in an underground 12,000 gallon tank. Jet A fuel is stored in a 500 gallon fuel truck.

Utilities

The utilities at the airport are extensions from the industrial park located on the south side of the airport. Water, electric and telephone utilities are provided from the private sector. Both electric and telephone utilities are standard overhead service at this time. Water mains within airport property are comprised of 6 and 10 inch diameter pipe. The 10 inch mainenters the airport property from the south and serves the existing terminal to include a fire hydrant. The 6 inch main enters airport property from the east along the north side of Airport Road and terminates approximately 100 feet east of the Taxiway C intersection.

1.4 AIRPORT METEOROLOGICAL DATA

Winds are the primary factor in determining runway alignment. Generally the runway aligns with the direction of the prevailing wind. The Federal Aviation Administration (FAA) recommends that an airport have a minimum of 95 percent wind coverage for a 12 knot crosswind component for aircraft with an approach speed of less than 121 knots and a wingspan of less than 79 feet (B-II). If 95 percent coverage cannot be realized on one runway, a crosswind runway may be justified and eligible for Federal participation.

Wind coverage can be described with a wind rose illustrating the percent of time a wind comes from a certain direction and the velocity of the wind. The wind coverage per 54,917 observations during the years 1969-1970 and 1973-1981 indicates 99.6 percent coverage at 13 knots and 99.9 percent coverage at 16 knots. More recent observations (1995) were used in the development of an updated wind rose. The new wind rose reveals very similar results to the previous wind rose with 99.8% coverage at 13 knots and 99.9% coverage at 16 knot cross winds. As a result, a cross wind runway does not appear justified or necessary at this time.

Review of Climatological Data published by the National Oceanic and Atmospheric Administration indicates that July is typically the hottest month of the year in the area. The mean maximum temperature in July, based on review of records from 1978 through 1989, is 106 degrees Fahrenheit. which corresponds to the previous ALP for Casa Grande.

1.5 LAND USE

Much of the land surrounding the Casa Grande Airport is used for industrial purposes. A portion of the airport property is bound on the north by private property with the Gila River Indian Reservation approximately 2 miles to the north, and on the east by Arizona Highway 387. There are numerous residences located east of Highway 387, which apparently do not conflict with airport uses, or encroach on the Runway Protection Zone, but should be examined for potential conflict with future development at Casa Grande Municipal Airport.

The Asarco Mine is located 2 miles west of the airport. The extended runway centerline intersects the south east portion of the excavated area. Although the mine is not considered a noncompatible land use, there may be times when dust clouds, during high winds, could be somewhat hazardous.

A city owned industrial park lies on the south side of the airport. The industrial park is currently accessible by taxiway from the airport. However, at the time of this writing the City is in the process of selling the lots in the Industrial Park and eliminating the need to lease the property. If a private party is allowed access from outside of the airport boundary it is considered a "through the fence" operation, which is a non-compliance situation when Federal funding has been provided to the airport owner in the form of a Grant. In order for the city to sell the lots to a private individual or company, access to the airport will have to eliminated. If the City chooses to allow access from the industrial park, perhaps a monthly or annual fee could be charged in the form of a lease agreement or access fee to prevent a "through the fence" operation. It is recommended that the City obtain concurrence from the FAA prior to allowing access from adjacent private property.

1.6 DEMOGRAPHIC AND ECONOMIC DATA

When planning airport facilities, consideration is given to the present and future populations and the general economic status of the area served by the airport. Local business trends and needs are also considered. These factors help determine how many people will be using the airport, what kind of aircraft will be operating on the airport, and finally, the facilities that these users will need for safe and convenient air travel.

The information presented in this section provides only background data on a large subject matter. The attempt is to provide a basis for aviation forecasts. While demographic data for Casa Grande is limited, additional data is derived from statewide and county-wide sources, and is prorated to the study area as presented in Table 1.1 which follows:

TABLE 1.1

ARIZONA AIRPORT SYSTEM STATISTICS

Arizona	Population
Total Population (1990 census)	3,665,228
Area (square miles)	113,510
Counties	15
Population/square mile	32.3
Airmen	16,219
Airmen/10,000 population	44
Aircraft (general aviation)	6,307
Aircraft/1,000 square miles	44
Aircraft/10,000 population	13
Airports/100,000 population	119

Sources: National Airport System Plan 1986-1995
Dept. of Commerce, 1990 Census

1.7 POPULATION

Population in Arizona is sensitive to climate and resource development and as such has experienced radical shifts in some counties. Current and projected population statistics for Arizona, Pinal County and Casa Grande are provided in Table 1.2 following. Statewide, the population has been very steady, increasing from 1,770,900 in 1970 to 2,715,215 in 1980. This represents an annual increase of 5.3 percent between 1970 and 1980. The 1990 census data for the State indicates a population of 3,665,228. This represents an annual increase between 1980 and 1990 of 3.5 percent.

Pinal County has experienced a population increase since 1970. There was a significant increase in population from 1981 to 1991, approximately 3.4 percent per year. Pinal County's annual rate of growth is expected to decline to 1.2 percent per year by the year 2010.

The population growth of Casa Grande, the largest city in the County, has also grown substantially. Population projections for Casa Grande are expected to increase to 32,300 by the year 2015, or an annual increase of 2.1 percent.

TABLE 1.2

STATE/COUNTY/LOCAL POPULATION STATISTICS
Actual Census Data 1970-1990
Projected Data 1995-2015

POPULATIONS	1970	1980	1990	1995*	2000*	2010*	2015*
ARIZONA (avg. annual percent change)	1,770,900 (–)	2,715,215 (5.3)	3,665,228 (3.5)	4,134,925 (2.6)	4,632,875 (2.4)	5,652,534 (2.2)	6,212,000 (2.0)
PINAL COUNTY (avg. annual percent change)	67,916 (–)	90,918 (3.4)	116,379 (2.8)	128,825 (2.1)	138,775 (1.5)	158,050 (1.4)	167,700 (1.2)
CASA GRANDE (avg. annual percent change)	10,536 (–)	14,971 (4.2)	18,675 (2.5)	21,495 (3.0)	22,930 (1.3)	29,315 (2.8)	32,300 (2.0)

Source: Arizona Department of Economic Security, February 1993. Populations for 1970, 1980, 1990

1.8 EMPLOYMENT

Arizona has experienced a growth in employment throughout the years. This trend in employment activities reflects the industries employing the majority of employees. The four main sources of employment for Pinal County are public Administration, followed by retail, manufacturing and mining. Table 1.3 indicates historic employment statistics.

TABLE 1.3		
PINAL COUNTY EMPLOYMENT 1980-2000		
YEAR	**EMPLOYED**	**PERCENT CHANGE**
1980	30,852	--
1990	44,928	45.6
2000-Forecast	45,436	1.1

Source: Arizona DOT, *1995 Arizona State Aviation Needs Study*, Page 3-3.

1.9 ECONOMIC FACTORS

Between 1981 and 1991, personal income in Arizona increased from $9,819 per person to $12,733 per person. The growth in per capita income represents a $2.76 billion increase in statewide personal income over the ten year period. The average rate of growth in Pinal County for per capita personal income was 16.4% and Statewide was 29.7%. The primary and secondary net assessed values for Casa Grande were 2.25% and 1.44% respectively per year over the period of record shown on Tables 1.4 and 1.5. The rate of growth for primary and secondary net assessed values for Pinal County were 3.76% and 3.5% respectively per year over the periods.

TABLE 1.4							
PER CAPITA INCOME (DOLLARS) 1981-1991							
	1981	1983	1985	1987	1989	1991	Average 1981-1991
ARIZONA (percent change)	9819 ( )	10,402 (5.9)	10,985 (5.6)	11,567 (5.3)	12,150 (5.0)	12,733 (4.9)	11,296 (29.7)
PINAL COUNTY (percent change)	12,777 (0)	12,105 (5.3)	11,432 (5.5)	10,760 (5.8)	10,087 (6.2)	9,415 (6.6)	11,096 (16.4)

Source: Department of Transportation, 1995 Arizona State Aviation Needs Study

TABLE 1.5

PRIMARY NET ASSESSED VALUATION HISTORY
1987-1995

	1987	1988	1989	1990	1991	1992	1993	1994	1995	Average 87-95
ARIZONA										
(billions $)	17.964	19.286	21.001	21.660	21.617	21.533	21.381	21.688	22.110	
(percent change)	(--)	(7.24)	(8.89)	(3.04)	(-0.2)	(-0.4)	(-0.7)	(1.44)	(1.95)	(2.63)
PINAL COUNTY										
(million $)	422.940	476.255	535.674	546.877	552.425	559.036	570.983	564.820	568.150	
(percent change)	(--)	(12.60)	(12.48)	(2.09)	(1.01)	(1.20)	(2.14)	(-1.08)	(0.59)	(3.76)
CASA GRANDE										
(million $)	77.300	84.970	94.108	96.709	96.479	94.238	94.250	92.398	91.558	
(percent change)	(--)	(9.92)	(10.75)	(2.76)	(-0.24)	(-2.32)	(0.01)	(-1.97)	(-0.91)	(2.25)

Source: Arizona Tax Research Association.

TABLE 1.5

SECONDARY NET ASSESSED VALUATION HISTORY
1987-1995

	1987	1988	1989	1990	1991	1992	1993	1994	1995	Average 87-95
ARIZONA										
(billions $)	19.339	20.817	22.334	22.533	22.189	21.934	21.381	21.688	22.110	
(percent change)	(--)	(7.64)	(7.29)	(0.89)	(-1.53)	(-.4)	(-0.7)	(1.44)	(1.95)	(1.55)
PINAL COUNTY										
(million $)	442.676	503.670	565.719	575.540	573.708	572.046	578.335	573.273	576.476	
(percent change)	(--)	(13.78)	(12.32)	(1.71)	(-0.29)	(-0.29)	(1.10)	(-0.88)	(0.56)	(3.50)
CASA GRANDE										
(million $)	83.316	89.695	99.541	99.870	99.362	96.421	95.560	93.791	92.617	
(percent change)	(--)	(7.65)	(10.98)	(0.33)	(-0.51)	(-2.96)	(-0.89)	(-1.85)	(-1.25)	(1.44)

Source: Arizona Tax Research Association.

1.10 SUMMARY

As CGMA has developed over the years, various improvements have been made to facilitate aviation. These improvements have served the community well. At the same time, however, the statistics presented within this Chapter clearly demonstrate continued growth of the area. Continued growth results in additional infrastructure pressure, including additional development requirements at CGMA. These additional development requirements together with prudent design criteria will be explored in the remainder of this Master Plan Update. The Inventory Chapter provides a basis to establish the needs of the Casa Grande Airport in the Facility Requirements Chapter. The population and economic statistics will be useful in Chapter 2, Forecasts, to establish trends and project future demands on the airport.